



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,148	02/01/2002	Yoshiyuki Ishii	Q67564	9744
23373	7590	08/19/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			YAM, STEPHEN K	
			ART UNIT	PAPER NUMBER
			2878	

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/060,148

Applicant(s)

ISHII ET AL.

Examiner

Stephen Yam

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to Amendments and remarks filed on June 3, 2004. Claims 1-18 are currently pending.

Claim Objections

1. Claims 1, 11, and 16 are objected to because of the following informalities:

In the claim language, it is unclear how the optical system is both between the reflector and the light-transmissive sheet-like body and also between the light-transmissive sheet-like body and the light detecting means.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Schaede et al. US Patent No. 5,764,367.

Schaede et al. teach (see Fig. 3) an apparatus for detecting a light-transmissive sheet-like body (1) (see A3 intensity in Fig. 2), comprising a light source unit (8) for emitting illuminating light (26), light detecting means (2) for detecting the illuminating light, and an optical system

Art Unit: 2878

(23, 21) for leading the illuminating light as parallel-beam light (see Col. 5, lines 64-67) to the light-transmissive sheet-like body and converging (see Col. 6, lines 52-55) the illuminating light to said light detecting means, wherein an edge of the light-transmissive sheet-like body placed between said light source unit and said optical system is detected (see Col. 6, lines 60-67) based on a difference between two types of information, said two types of information including information of said illuminating light which is led to said light detecting means through said edge and another information of said illuminating light which bypasses said edge and is led to said light detecting means (see Col. 5, lines 13-20).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 5-7, 9-11, 13, 15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Halter US Patent No. 6,323,954 in view of Miranda US Patent No. 3,594,087.

Regarding Claims 1, 2, 5, 7, 10, 11, 13, 15, 17, and 18, Halter teaches (see Fig. 8) an apparatus for detecting a light-transmissive sheet-like body (G) comprising a light source unit (12) for emitting illuminating light, a reflector (R) for reflecting the illuminating light, light detecting means (11.1, 11.2, 11.3) for detecting the illuminating light which is reflected by said reflector, and an optical system (14, 15, 13.1, 13.2, 13.3) for leading (using (14)) the illuminating light reflected by said reflector to the light-transmissive sheet-like body and converging (using

Art Unit: 2878

13.1, 13.2, 13.3) the illuminating light reflected by said reflector to said light detecting means, wherein an edge (K) of the light-transmissive sheet-like body placed between said optical system and the reflector is detected based on a difference between two types of information, including information (2) (see Fig. 5a-5e and Col. 5, line 30 to Col. 6, line 31) of said illuminating light which is led to said light detecting means through said edge and another information (1) (see Fig. 5a-5e and Col. 5, line 30 to Col. 6, line 31) of said illuminating light which bypasses said edge and is led to said light detecting means (see also Fig. 3 and Col. 4, lines 60-64). Regarding Claim 2, Halter teaches (see Fig. 2e) the light detecting means comprising a two-dimensional area sensor for obtaining two-dimensional distribution information of said illuminating light (see Col. 4, lines 41-43). Regarding Claim 5, Halter teaches the optical system comprising a telecentric optical system (see Fig. 8) for leading said illuminating light therethrough to said light detecting means. Regarding Claim 7, Halter teaches (see Fig. 8) the optical system comprising a half-silvered mirror (15) for leading the illuminating light emitted from said light source to said light-transmissive sheet-like body and leading the illuminating light reflected by said reflector to said light detecting means. Regarding Claim 10, Halter teaches (see Fig. 2e) the light detecting means as a CCD camera (see Col. 4, lines 41-43). Regarding Claim 11, Halter teaches the light detecting means as an image capturing means (see Col. 4, lines 41-43) and an image processor (see Col. 7, lines 4-5) for processing images captured by the image capturing means. Regarding Claim 13, Halter teaches the image processor scanning (see Fig. 6) the images captured by the image capturing means in the direction in which the light-transmissive sheet-like body is fed, said image processor detects the image density (see Fig. 6), and said image processor determines the position of an edge of said image to be where the image density changes by a predetermined

Art Unit: 2878

amount (see Col. 6, lines 17-21 and 59-64 and Col. 7, lines 11-19). Regarding Claim 15, Halter teaches (see Fig. 8) the reflector reflecting illuminating light in a direction opposite to a direction in which the illuminating light comes to the reflector. Regarding Claim 17, Halter teaches (see Fig. 8) the illuminating light passing through the light-transmissive sheet-like body twice before entering said light detecting means. Regarding Claim 18, Halter teaches (see Fig. 8) at least one element (14) of said optical system placed on an optical path (A) from said light source unit to said reflector through said half-silvered mirror. Halter does not teach the illuminating light reflected by said reflector as parallel-beam light. Miranda teaches (see Fig. 2) a similar device, with an optical system (12, 30) for leading illuminating light (originating from (10)) reflected by a reflector (26) as parallel-beam light (see Fig. 2 and Col. 2, line 73 to Col. 3, line 7 and Col. 3, lines 14-20- the light beams reflected off the reflector are parallel to the respective light beams prior to the reflection) to a light-transmissive sheet-like body (22) and converging (30) the illuminating light reflected by said reflector to a light detecting means (32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use parallel beam light for the illuminating light and converge the reflected parallel beam light to the light detecting means as taught by Miranda in the apparatus of Halter, to effectively confine the illuminating light to improve detection sensitivity through increased contrast.

Regarding Claim 6, Halter in view of Miranda teach the apparatus in Claim 5, according to the appropriate paragraph above. Halter also teaches the telecentric optical system comprising a condenser lens (see Col. 4, lines 64-67) disposed on a side closer to said reflector. Halter does not teach an aperture member disposed at a focal point of said condenser lens on a side closer to said light detecting means. It is well known in the art to place an aperture member at a focal

Art Unit: 2878

point of a lens, to maximally define the field of view of a light detector. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an aperture member at a focal point of the lens in the apparatus of Halter in view of Miranda, to define the view of the light detecting means to maximally detect the light.

Regarding Claim 9, Halter in view of Miranda teach the apparatus in Claim 1, according to the appropriate paragraph above. Halter does not teach the light-transmissive sheet-like body made of a photosensitive material and sensitive to visible light and the illuminating light having a wavelength of at least 850 nm. It is well known in the art that photographic film are photosensitive materials and are sensitive to visible light, and an infrared light source (750nm to 1 μ m wavelength) is used in a detector device to prevent interference from the visible light spectrum. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a film sensitive to visible light as the light-transmissive sheet-like body and an illuminating light having a wavelength of at least 850nm, to use photographic film sensitive to visible light and an infrared light source of at least 850nm in the apparatus of Halter in view of Miranda, to provide edge detection in a film camera or scanner without affecting the photosensitive material of the film media.

6. Claims 3, 4, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Halter in view of Miranda as applied to Claims 1, 11, and 13, further in view of Anzai et al. US Patent No. 4,713,550.

Regarding Claims 3 and 4, Halter in view of Miranda teach the apparatus in Claim 1, according to the appropriate paragraph above. Regarding Claim 4, Halter teaches (see Fig. 8) a

Art Unit: 2878

plurality of light detecting means (11.1, 11.2, 11.3) and processing means (see Col. 6, line 65 to Col. 7, line 5) for processing information obtained by said plurality of light detecting means.

Halter does not teach a plurality of optical systems spaced from each other along the length of said light-transmissive sheet-like body or the processing means calculating the length of the light-transmissive sheet-like body. Anzai et al. teach (see Fig. 2) an apparatus for detecting a light-transmissive sheet-like body (see Col. 1, lines 35-39)) comprising a light source unit (LD₁-LD₄) for emitting illuminating light, a reflector (5) for reflecting the illuminating light, light detecting means (PD₀-PD₄) for detecting the illuminating light which is reflected by said reflector, wherein an edge of the light-transmissive sheet-like body placed between the converging optical system and the reflector is detected based on a difference between two types of information, including information of said illuminating light which is led to said light detecting means through said edge and another information of said illuminating light which bypasses said edge and is led to said light detecting means (see Col. 1, lines 45-62 and Col. 5, lines 38-66), also including a plurality of light detecting means spaced from each other along the length of the light-transmissive sheet-like body for calculating the length of the light-transmissive sheet-like body. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide multiple light detecting means spaced along the length of the light-transmissive sheet-like body as taught by Anzai et al. and provide an optical system for each light-detecting mean in the apparatus of Halter in view of Miranda, to determine document length for scanning in addition to edge detection for scan dimensions.

Regarding Claims 12 and 14, Halter in view of Miranda teach the apparatus in Claims 11 and 13, according to the appropriate paragraph above. Halter also teaches the image processor

Art Unit: 2878

determining the positions of edges of said images (see Col. 6, line 65 to Col. 7, line 5). Halter does not teach said image processor determining the length of the light-transmissive sheet-like body based on the positions of edges. Anzai et al. teach (see Fig. 2) an apparatus for detecting a light-transmissive sheet-like body (see Col. 1, lines 35-39)) comprising a light source unit (LD₁-LD₄) for emitting illuminating light, a reflector (5) for reflecting the illuminating light, light detecting means (PD₀-PD₄) for detecting the illuminating light which is reflected by said reflector, wherein an edge of the light-transmissive sheet-like body placed between the converging optical system and the reflector is detected based on a difference between two types of information, including information of said illuminating light which is led to said light detecting means through said edge and another information of said illuminating light which bypasses said edge and is led to said light detecting means (see Col. 1, lines 45-62 and Col. 5, lines 38-66), and a processor (10) determines (see Col. 1, lines 35-39) the length of the light-transmissive sheet-like body based on the positions of edges. It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect the length of the sheet-like body as taught by Anzai et al. in the apparatus of Halter in view of Miranda, to determine document length for scanning in addition to edge detection for scan dimensions.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Halter in view of Miranda as applied to Claim 1, further in view of Ushio et al. US Patent No. 6,489,624.

Halter in view of Miranda teach the apparatus in Claim 1, according to the appropriate paragraph above. Halter does not teach the light source and the optical system connected to each other by an optical fiber for leading the illuminating light source. Ushio et al. teach (see Fig. 13)

Art Unit: 2878

an apparatus with a light source unit (connected to the end of (71)) for emitting illuminating light, reflector (76) for reflecting the illuminating light, light detecting means (82) for detecting the illuminating light reflected by the reflector, and a converging optical system (72, 74, 75, 77, 78, 79), wherein the light source and the converging optical system are connected to each other by an optical fiber (71) for leading the illuminating light. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the optical fiber as taught by Ushio et al. in the apparatus of Halter in view of Miranda, to confine the light between the source and the converging optical system to maximize the emitted intensity onto the sheet-like body for improved detection.

Response to Arguments

8. Applicant's arguments filed June 3, 2004 have been fully considered but they are not persuasive.

Regarding Applicant's arguments on the Schaefer reference, Applicant argues that Schaefer does not teach detecting a light-transmissive sheet-like body but instead teaches detecting paper, metal, or foils which are opaque to light (Col. 3, line 66 to Col. 4, line 6). Examiner asserts that while Schaefer describes the detected sheet-like bodies as "essentially light-absorbent" (see Col. 3, lines 66-67), it is recognized that paper (such as newspaper or office copy/printer paper) is partially light-transmissive, and furthermore, Fig. 2 shows an intensity (A3) of transmitted light as having a positive value when the detector is covered by the sheet (see Col. 5, lines 16-18). Since the claim limitations must be viewed in their broadest interpretation,

Art Unit: 2878

the sheet of Scharde anticipates a "light-transmissive sheet-like body" as recited in Applicant's claim language.

Regarding Applicant's arguments on Halter in view of Miranda, Applicant argues that Miranda does not teach the leading of light reflected by the reflector as parallel light but instead, that light reflected from the reflective mirror converges towards the medium. Examiner asserts that the claim language recites "... light reflected by said reflector as parallel-beam light...", but does not specify the components of comparison for the "parallel" attribute. It appears that perhaps Applicant intends for multiple beams of light reflected by the reflector to be parallel to each other- however, Examiner interprets the parallel-beam light as being the beams of light reflected by said reflector as parallel (and furthermore, on the identical path) to the respective beams of light prior to the reflection, which Miranda teaches (see Fig. 2, Col. 2, line 73 to Col. 3, line 7 and Col. 3, lines 14-20- "the retroreflective member 26 serves to redirect each ray of light back along its original path"). Applicant's claim language does not recite the details of the relationship of "parallel-beam light", and Examiner asserts that the claim language must be viewed in its broadest interpretation in light of the specification, without reading limitations within the specification into the claim. Therefore, Examiner contends that Miranda teaches the limitation of "leading the illuminating light reflected by said reflector as parallel-beam light to the light-transmissive sheet-like body", as recited by Applicant's claim language.

Applicant also argues that Halter does not teach light that bypasses the edge, but merely light that passes through the edge but undergoes some attenuation. First off, Examiner repeats the assertions, as stated in prior arguments (see section 11 of prior Office Action mailed 3/3/2004), that the apparatus of Fig. 8 is identical in functionality to Fig. 3 and 4 (see Col. 8,

Art Unit: 2878

lines 19-22) except for a difference in physical placement of components. Examiner also asserts that Halter does teach light that bypasses the edge, and further directs Applicant to Fig. 5a-5e which illustrates the intensities of detected light before (K.1), during (K.2), and after (K.3) the edge passes the optical path (from (12) to (11)- see Fig. 5e) according to the operation of the apparatus of Fig. 3 (see Col. 5, lines 29-31). As seen in Fig. 5a-5d, the curve (1) in the graph represents the intensity of light at position (K.1) for the object, for an undisturbed light beam (see Col. 5, lines 45-47 and Col. 6, lines 3-7) and therefore, is always at the maximum intensity I_{\max} (see Fig. 5a-5d, Col. 5, lines 59-68, Col. 6, lines 3-7). Since the intensity at point (K.1) is at I_{\max} regardless of the transparency of the object (from a transparent object (Fig. 5a) to completely non-transparent object (Fig. 5d)- see Col. 5, lines 59-68), the light intensity at K.1 *must* be representative of the light that bypasses the edge.

Applicant also argues that converged light is not parallel light, and converging the light is the opposite of making the light beams parallel. Examiner asserts that only the reflected light beams are made parallel to the respective light beams prior to the reflection (see above arguments), as Miranda explains (see Col. 2, line 73 to Col. 3, line 8), which limits the diffusion of light thereby causing reduced detector sensitivity, and the converging of light occurs immediately prior to the detection of the light at the detector, also providing increased detector sensitivity by focusing all the related light onto the photosensitive area of the detector.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (571)272-2449. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571)272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SY
SY


THANH X. LUU
PATENT EXAMINER